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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,213	07/01/2003	Peter H. Berasi	FIS920030099US1	1212

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EXAMINER

CULBERT, ROBERTS P

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/604,213

Applicant(s)

BERASI ET AL.

Examiner

Roberts Culbert

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 29 and 30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/15/03.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Art Unit: 1763

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I (claims 1-28) in the reply filed on 9/16/05 is acknowledged. Claims 29-30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3, 7, 10, 13, 21, 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,268,068 to Cowell et al. in view of IBM TDB NN62096.

Regarding Claims 1, 7, 15, and 21, Cowell et al. teach a method of manufacturing a molybdenum (Moly) mask comprising: depositing a photoresist on both sides of a molybdenum foil sheet, wherein the molybdenum foil sheet is approximately 3-5 mils thick (Col. 2, Line 41), exposing and developing the

Art Unit: 1763

photoresist to have at least one opening having a diameter of greater than 3.5 mils (reads on approximately 4 mils), and simultaneously etching both sides of the molybdenum foil sheet. (Col. 4, Lines 56-63)

Cowell et al. do not expressly teach that the spray pressure is 5 psi however, Cowell et al. does teach that spraying from both sides is conventional for the etching process. (Col. 2, Lines 25-30) However IBM TDB NN62096 teaches that a spray pressure of 4-16 psi is suitable for application of a liquid etchant solution to both sides of a molybdenum foil in order to form an aperture for a Moly mask. It would have been obvious to one of ordinary skill in the art at the time of invention to use a suitable spray pressure such as 5 psi in order to provide effective contact between an etchant solution and a Moly foil substrate.

Cowell et al. do not expressly teach that the moly foil is 8 mils thick, the photoresist is 12 microns thick, the diameter of the photoresist opening is at least 7 mils, or that the via is 10 –14 mils. However, it has been held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)

Regarding claims 3, 10, 16 and 24, Cowell et al. teach that the etching process undercuts molybdenum adjacent the photoresist, leaving an unsupported edge. (See Figure 2C)

Regarding Claim 13, 19 and 27, IBM TDB NN62096 teaches removing the photoresist with a solvent.

Claims 2, 4-6, 11, 12, 14-20, 25, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,268,068 to Cowell et al. in view of IBM TDB NN62096, and in further view of U.S. Patent Application Publication 2004/0238491 to Berasi et al.

Regarding Claims 2 and 15, Cowell et al. in view of IBM TDB NN62096 does not expressly teach a knife-edge of approximately 0.2 mils. However, Berasi et al. teach a knife-edge of approximately 0.2 mils. (Paragraph 65) It would have been obvious to one of ordinary skill in the art at the time of invention

Art Unit: 1763

to adjust the knife edges as taught by Berasi so that the mask may be removed easily without damaging deposited metallurgy or the mask.

Regarding Claims 4-6, 11, 12, 14, 17, 18, 20, 25, 26 and 28, Cowell et al. in view of IBM TDB NN62096 does not expressly teach adjusting pH with sodium hydroxide 3 times, or monitoring and controlling the concentration of molybdate complex; Fe concentration and Oxidation/Reduction Potential (ORP). However, Berasi et al. teach controlling pH, total Fe concentration, and Oxidation/Reduction Potential (ORP). See paragraph 49, for example. It would have been obvious to one of ordinary skill in the art at the time of invention to monitor the etch process as taught by Berasi et al. in order to control the etch rate and geometry of the etched vias.

Claims 8, 9, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,268,068 to Cowell et al. in view of IBM TDB NN62096, and in further view of IBM TDB NN7707577.

As applied above, Cowell et al. in view of IBM TDB NN62096 teaches the method of the invention substantially as claimed but does not teach that the first resist opening is smaller than the second resist opening, or that the first resist opening is 7 mils and the second resist opening is 11 mils. However, IBM TDB NN7707577 teach that the first resist opening is smaller than the second opening (see figure 3, for example) It would have been obvious to one of ordinary skill in the art at the time of invention to form the resist pattern with the smaller first resist opening in order to accommodate suitable aperture patterns. Further, regarding the particular recited dimensions of the resist openings, it has been held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)

Art Unit: 1763

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. Culbert
Examiner
Art Unit 1763



P.L.
Parviz Hassanzadeh
Supervisory Patent Examiner
Art Unit 1763